

# BOSS TU-12 / SERVICE NOTES

## CHROMATIC TUNER TU-12H Third Edition

**NOTE**

Note that both TU-12A and TU-12 are marked "TU-12" on their panels.

**NOTE**

Note that both TU-12HA and TU-12H are marked "TU-12H" on their panels.

**NOTE**

TU-12A, TU-12 どちらもパネル面の表示は "TU-12" となっていますので、注意してください。

**NOTE**

TU-12HA, TU-12H どちらもパネル面の表示は "TU-12H" となっていますので、注意してください。

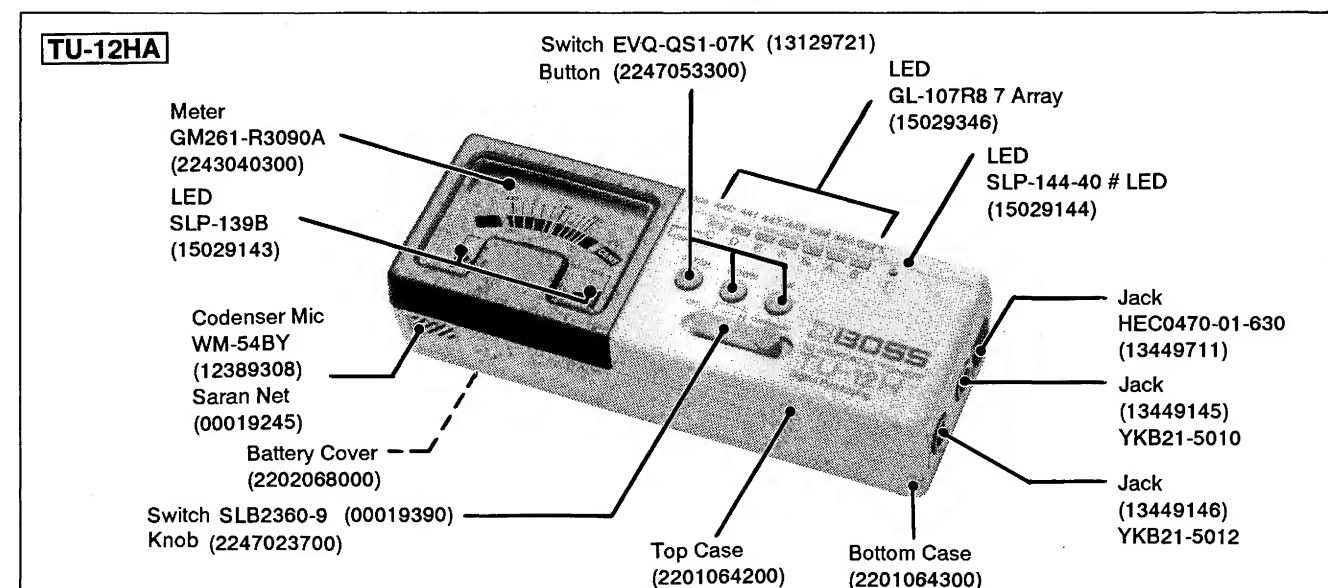
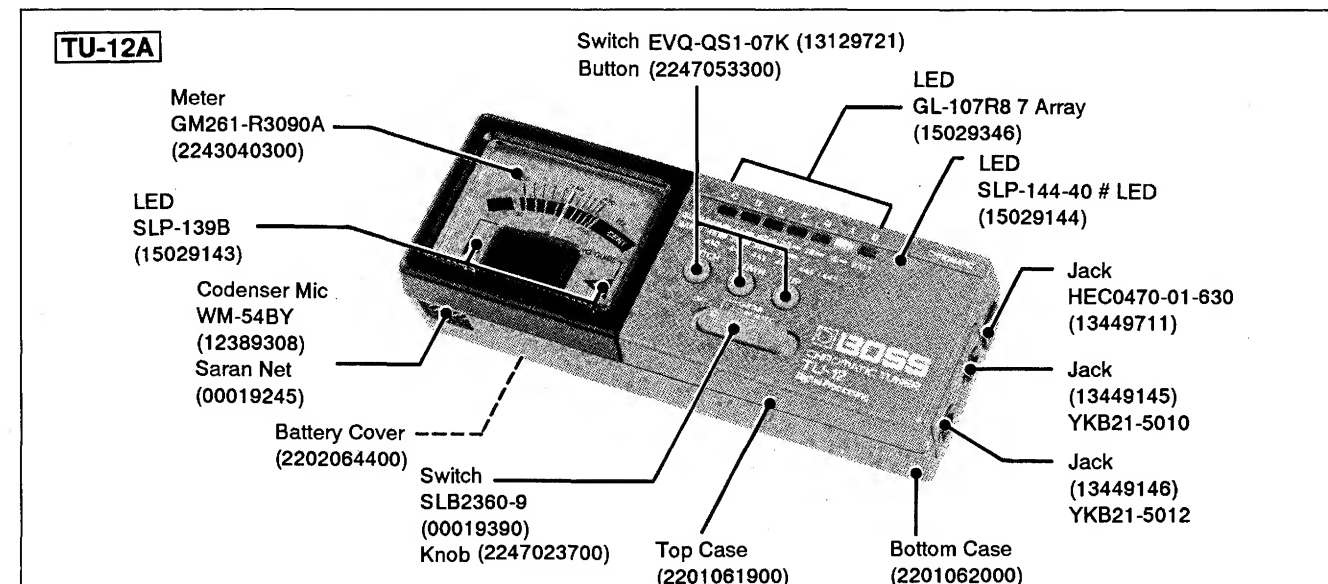
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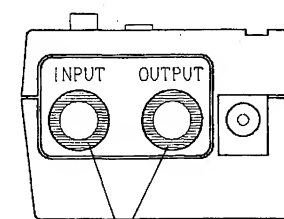
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### How to distinguish between TU-12A/12HA(new) and TU-12/12H(old)

TU-12A/12HA

Black(Plastic)  
黒色 (プラスチック)

(Fig.A)

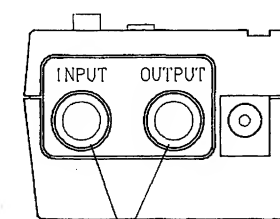
To distinguish between TU-12A/HA(new) and TU-12/12H(old), see the INPUT or OUTPUT jack(Fig.A) and check the serial number(Table.1).

If the jack is silver(Metal), it must be TU-12/12H(old type).

If the jack is black(plastic), it must be TU-12A/12HA(new type).

### TU-12A/12HA(新バージョン)と TU-12/12H(旧バージョン)の見分け方

TU-12/12H

Silver(Metal)  
銀色 (金属)

TU-12A/12HA(新バージョン)とTU-12/12H(旧バージョン)を見分ける為に、「INPUT」(又は「OUTPUT」)ジャックを見て下さい。(Fig.A参照)

もし、ジャックが銀色(金属)なら、TU-12/12H(旧バージョン)です。もし、ジャックが黒色(プラスチック)なら、TU-12A/12HA(新バージョン)です。

又、シリアル・ナンバーからも新旧バージョンを確認することができます。(Table.1参照)

### Difference Between TU-12A/12HA(new) and TU-12/12H(old)

### TU-12A/12HA(新バージョン)とTU-12/12H (旧バージョン)の違い

(Table.1)

|              | TU-12A/12HA (NEW)                           | TU-12/12H (OLD)                                       |
|--------------|---|---|
| Serial No.   | QE97100-up (TU-12A)<br>DF05250-up (TU-12HA) | Prior to QE97100 (TU-12)<br>Prior to DF05250 (TU-12H) |
| PCB Assy No. | 7843751000 (TU-12A)<br>7843851000 (TU-12HA) | 79306530 (TU-12)<br>79307510 (TU-12H)                 |

### SPECIFICATIONS/仕様 (new type)

- Controls ..... Power/Mode Selection Switch, PITCH Button, DOWN Button, UP Button
- Indicators ..... NOTE Name/PITCH Indicator, Meter Tuning Guide Indicators
- Jacks ..... Input Jack, Output Jack, AC Adaptor Jack
- Input Impedance ..... 1M  $\Omega$
- Standard Pitch ..... 440Hz to 445Hz 1Hz step
- Tuning Range ..... TU-12 :C1 (32.70Hz) to B5 (987.77Hz)  
TU-12H :C1 (32.70Hz) to B6 (1975.53Hz)
- Tuning Accuracy .....  $\pm 1$  cent
- Power Supply ..... DC9V : Dry Battery(9V type)  
AC Adaptor(PSA - Series : option)
- Current Draw ..... 20mA (DC9V)MAX
- Dimensions ..... 137(W)  $\times$  53(D)  $\times$  35(H)mm  
5 - 3/8(W)  $\times$  2 - 1/16(D)  $\times$  1 - 3/8(H)inches
- Weight ..... 170 g / 6 oz
- Accessories ..... TU-12A Soft Case (22010740)  
TU-12HA Soft Case (22010738)  
Dry Battery(9V type) (12569103RT)  
TU-12A Owner's Manual(English) (2602080200)  
TU-12A Owner's Manual(Japanese) (2602080100)  
TU-12HA Owner's Manual(English) (2602081200)  
TU-12HA Owner's Manual(Japanese) (2602081100)  
TU-12HA Syakuhachi Manual(Japanese Only) (26020814)  
TU-12HA Koto and Syamisen Manual(Japanese Only) (26020813)
- Options ..... AC Adaptor;PSA - 100,PSA - 120,PSA - 220,PSA - 240  
Dry Battery;S - 006P/9V(6F22/9V),6AM6/9V(alkaline)

### METER ADJUSTMENT

- While holding down PITCH, switch the unit ON.  
The unit enters test mode.
- Adjust CR1 so that the pointer stays in the 0 cent (center of the meter face).
- Switch the unit OFF to exit the test mode.

### メーター調整

- PITCHを押しながら電源を入れる。  
(テスト・モードに入る。)
- CR1を調整して指針をゼロセント(目盛中央)に合わせる。
- 終了すれば電源を切りテスト・モードから出る。

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

PARTS LIST/ パーツリスト (TU-12A/TU-12HA)

SAFETY PRECAUTIONS:

The parts marked Δ have safety-related characteristics. Use only listed parts for replacement.

安全上の注意:  
Δが付いている部品は、安全上特別な規格でつくられたものです。  
交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

CONSIDERATIONS ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

Ex. QTY 10 PART NUMBER 22575241 DESCRIPTION Sharp key MODEL NUMBER C-20/50  
15 2247017300 Knob (orange) DAC-15D  
Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

パーツ発注に関するお願い  
オーダーシートには、必ず下記の4項目は正確に記入して下さい。(例外は除く)  
例) 必要数 パーツ番号 品名 使用機種  
15 2247017300 Knob (orange) DAC-15D  
もし記入漏れ、誤記等がある場合、必要部品が発送できなかったり、大規模な遅れの原因になります。  
御協力をお願いします。

PANEL/CASING/ パネル、ケース

|            |         |               |       |
|------------|---------|---------------|-------|
| 2201061900 | TU-12A  | Top Case      | Gray  |
| 2201062000 | TU-12A  | Bottom Case   | Gray  |
| 2202064400 | TU-12A  | Battery Cover | Gray  |
| 2201064200 | TU-12HA | Top Case      | White |
| 2201064300 | TU-12HA | Bottom Case   | White |
| 2202068000 | TU-12HA | Battery Cover | White |

PCB ASSY/ 基板完成品

|  |                    |  |
|--|--------------------|--|
| 7843751000                                     | TU-12A MAIN Board  |  |
| NOTE: MAIN Board does not include Meter.       |                    |  |
| 注意: 補修用 MAIN 基板はメーターを含みません。                    |                    |  |
| NOTE: Replacement MAIN Board includes SW Board |                    |  |
| 注意: 補修用 MAIN 基板は SW 基板を含みます。                   |                    |  |
| 7843851000                                     | TU-12HA MAIN Board |  |
| NOTE: MAIN Board does not include Meter.       |                    |  |
| 注意: 補修用 MAIN 基板はメーターを含みません。                    |                    |  |
| NOTE: Replacement MAIN Board includes SW Board |                    |  |
| 注意: 補修用 MAIN 基板は SW 基板を含みます。                   |                    |  |

KNOB,BUTTON/ ツマミ、ボタン

|            |                   |                          |
|------------|-------------------|--------------------------|
| 2247023700 | Slide Switch Knob | POWER/MODE SW            |
| 2247053300 | Tact Switch Knob  | PITCH SW, DOWN SW, UP SW |

SWITCH/ スイッチ

|          |             |                          |
|----------|-------------|--------------------------|
| 00019390 | SLB2360-9   | POWER/MODE SW            |
| 13129721 | EVQ-QS1-07K | PITCH SW, DOWN SW, UP SW |

JACK, SOCKET/ ジャック、ソケット

|          |                |              |
|----------|----------------|--------------|
| 13449711 | HEC0470-01-630 | Adaptor Jack |
| 13449146 | YKB21-5012     | INPUT        |
| 13449145 | YKB21-5010     | OUTPUT       |

POTENTIOMETER/ ボリューム

|          |               |             |
|----------|---------------|-------------|
| 00019312 | EVM-38GA00B23 | Trimmer 2kΩ |
|----------|---------------|-------------|

DISPLAY UNIT/ ディスプレイユニット

|            |       |  |
|------------|-------|--|
| 2243040300 | Meter |  |
|------------|-------|--|

IC

|          |             |                        |     |
|----------|-------------|------------------------|-----|
| 00019367 | SC412237FU  | Mask CPU               | IC1 |
| 15189251 | M5218AP     | OP AMP                 | IC4 |
| 00019412 | S-81250HG-Z | REGULATOR              | IC2 |
| 00019467 | S-80728AN-Z | Battery Level Detector | IC3 |

DIODE, LED/ ダイオード、LED

|          |                 |                               |
|----------|-----------------|-------------------------------|
| 15029346 | GL-107R8        | 7 Array LED, LED1-7           |
| 15029144 | SLP-144-40      | # LED, LED8                   |
| 15029143 | SLP-139B        | TUNING GUIDE LED, LED9, LED10 |
| 15019125 | 1SS-133         | D2, D3                        |
| 00019356 | 1SR139-100-T-32 |                               |

CRYSTAL/ クリスタル

|          |               |      |
|----------|---------------|------|
| 15299216 | DSMAT310 4MHz | Xtal |
|----------|---------------|------|

RESISTER/ 抵抗

|          |                 |              |       |     |
|----------|-----------------|--------------|-------|-----|
| 00120012 | CRB20T36EFX9763 | (metal film) | 976k  | R17 |
| 00120023 | CRB20T36EFX4753 | (metal film) | 475k  | R18 |
| 00120034 | CRB20T36EFX2403 | (metal film) | 240k  | R19 |
| 00120045 | CRB20T36EFX1203 | (metal film) | 120k  | R20 |
| 00120056 | CRB20T36EFX6042 | (metal film) | 60.4k | R21 |
| 00120067 | CRB20T36EFX3002 | (metal film) | 30k   | R22 |
| 00120078 | CRB20T36EFX1502 | (metal film) | 15k   | R23 |
| 00120101 | CRB20T24EFX5102 | (metal film) | 51k   | R26 |
| 00120089 | CRB20T36EFX4702 | (metal film) | 47k   | R27 |

WIRING/ ワイヤリング

|          |               |                                  |
|----------|---------------|----------------------------------|
| 00019256 | MAJ-5X26-94-3 | CONNECT MAIN Board with SW Board |
|----------|---------------|----------------------------------|

MISCELLANEOUS/ その他

|            |                      |                                |
|------------|----------------------|--------------------------------|
| 12389308   | Codenser Mic WM-54BY |                                |
| 00019223   | LED Holder A         | For NOTE/PITCH LED             |
| 00019201   | LED Holder B         | For # LED                      |
| 00019212   | LED Holder C         | For TUNING GUIDE LED           |
| 00019234   | LED Spacer           | For # LED                      |
| 2341741401 | Battery Connector    |                                |
| 22230568   | Battery Cushion      |                                |
| 00019245   | Saran Net            | For MIC.                       |
| 00120001   | Plate                | For POWER/MODE SW Knob, Orange |

ACCESSORIES/ 付属品

|            |  |       |
|------------|--|-------|
| 22010740   | TU-12A Soft Case                                 | Black |
| 22010738   | TU-12HA Soft Case                                | Beige |
| 12569103RT | Dry Battery (9V type)                            |       |
| 2602080200 | TU-12A Owner's Manual (English)                  |       |
| 2602080100 | TU-12A Owner's Manual (Japanese)                 |       |
| 2602081200 | TU-12HA Owner's Manual (English)                 |       |
| 2602081100 | TU-12HA Owner's Manual (Japanese)                |       |
| 26020814   | TU-12HA Syakuhachi Manual (Japanese Only)        |       |
| 26020813   | TU-12HA Koto and Syamisen Manual (Japanese Only) |       |

[TU-12A]  
MAIN BOARD  
ASSY 7843751000

NOTE

MAIN Board does not include Meter.  
補修用 MAIN 基板はメーターを含みません。

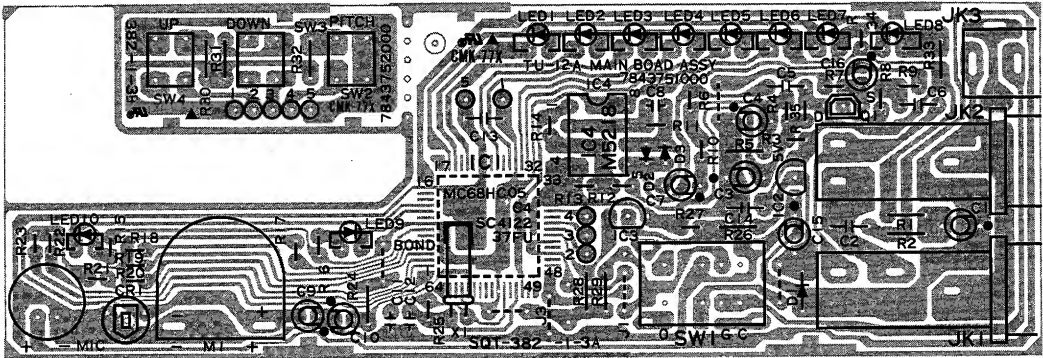
[TU-12HA]  
MAIN BOARD  
ASSY 7843851000

NOTE

Replacement MAIN Board includes SW Board  
補修用 MAIN 基板は SW 基板を含みます。

Switch Board

Main Board



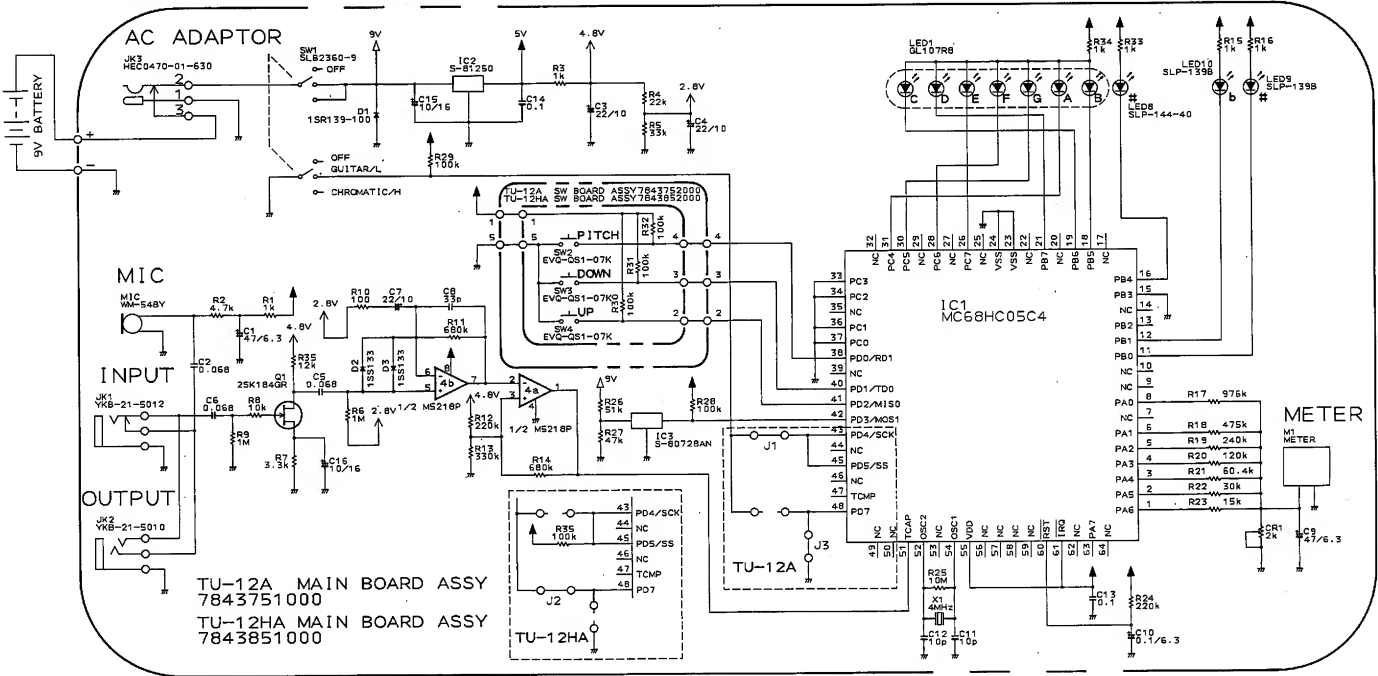
View from component side.

Difference Between TU-12HA PCB and TU-12A PCB

TU-12A PCB と TU-12HA PCB の違い

|                     | TU-12A  | TU-12HA |
|---------------------|---------|---------|
| Jumper 1            | ○       | Nothing |
| Jumper 2            | Nothing | ○       |
| Jumper 3            | ○       | Nothing |
| Resistor 35 (100 Ω) | Nothing | ○       |

CIRCUIT DIAGRAM / 回路図

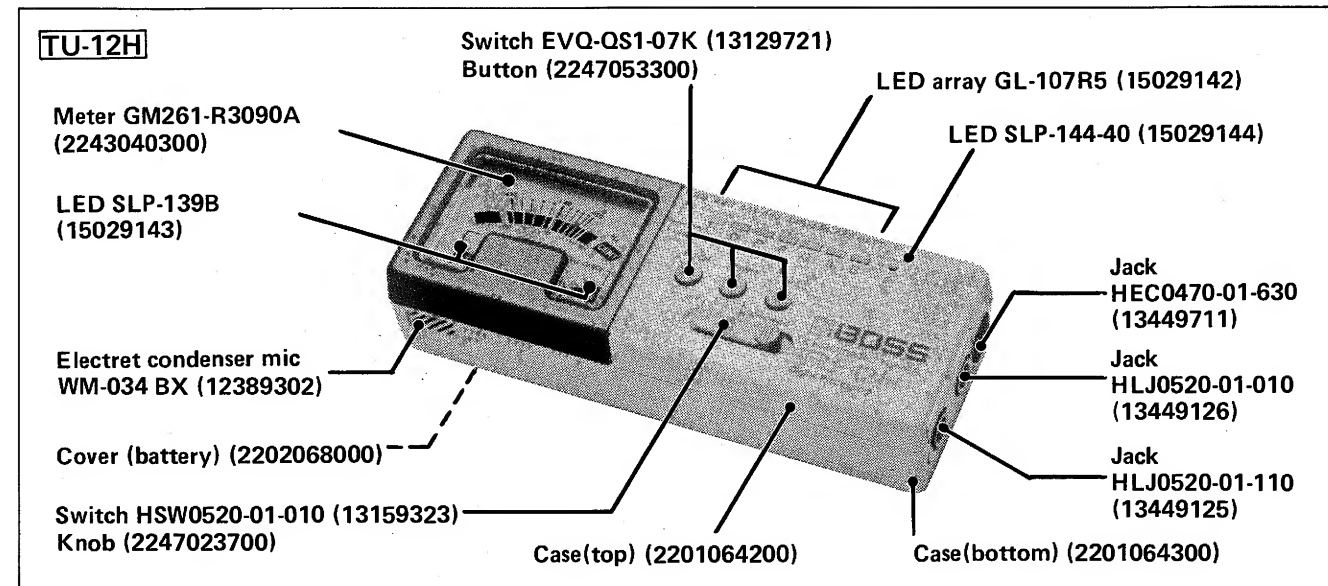


# BOSS TU-12H SERVICE NOTES

## First Edition

### SPECIFICATIONS

|                   |  |                |                              |
|-------------------|--|----------------|------------------------------|
| Power Consumption | : 9V DC @ 20mA   | Standard Pitch | : 440 to 445Hz 1Hz steps     |
| Tuning Range      | : C <sub>1</sub> (32.70Hz) to B <sub>6</sub> (1975.53Hz) | Dimensions     | : 145(W) x 35(H) x 53(D)mm   |
| Accuracy          | : ±1 cent  |                | : 5-7/16 x 1-3/8 x 2-1/16 in |
| Master Oscillator | : Quartz (3.579545MHz)                                   | Weight         | : 170g 6 oz                  |



### PARTS LIST

|            |   |        |                                       |
|------------|---|--------|---------------------------------------|
| 2201064200 | Case (top)                                | TU-12H | ELECTRET CONDENSER MIC                |
| 2201064300 | Case (bottom)                             | TU-12H | 12389302 WM-034BX                     |
| 2202068000 | Cover (battery)                           | TU-12H | CRYSTAL                               |
| 2201061900 | Case (top)                                | TU-12  | 12389712 3.579545MHz                  |
| 2201062000 | Case (bottom)                             | TU-12  | METER                                 |
| 2202064400 | Cover (battery)                           | TU-12  | 2243040300 GM261-R3090A (w/o cushion) |
| 2247023700 | Knob (power)                              |        | 2226033300 Cushion (TU-12 meter)      |
| 2247053300 | Button (PITCH, DOWN, UP)                  |        | IC                                    |
| 2341041400 | Battery snap 1007#24                      |        | 15179140 MBR1012-523 CPU              |
| JACK       |   |        | 15219126 LC7900 Generator/Divider     |
| 13449125   | HLJ0520-01-110 (INPUT)                    |        | 15189151 LA6458S or 4558S             |
| 13449126   | HLJ0520-01-010 (OUTPUT)                   |        | OP Amp, SIP 9P                        |
| 13449711   | HEC0470-01-630 (AC adaptor)               |        | 15229809 BA634 TU-12H                 |
| SWITCH     |   |        | DIODE                                 |
| 13159323   | HSW0520-01-010 slide (power)              |        | 15019209T0 S5500G                     |
| 13129721   | EVQ-QS1-07K light touch (PITCH, DOWN, UP) |        | 15019303 RD5.6JB2 (zener) TU-12       |
| PCB        |   |        | SN up to 294000                       |
| 79306530   | MAIN BOARD (pcb 2291057704) TU-12         |        | 15019304 RD6.2JB2 (zener) TU-12       |
| 79306540   | SWITCH BOARD (pcb 2291057704) TU-12       |        | 15019305 RD6.8JB2 (zener)             |
| 79307510   | MAIN BOARD (pcb 2291088802) TU-12H        |        | SN 304100 and up TU-12                |
| 79307520   | SWITCH BOARD (pcb 2291088802) TU-12H      |        | 15019128 MA27WB (varistor)            |
| TRIMMER    |   |        | SN 304100 and up TU-12                |
| 13299151   | H0651A009 2.2kΩ                           |        | 15019306 RD7.5JB2 (zener) TU-12H      |
|            |   |        | 15019302 RD5.1JB2 (zener) TU-12H      |
|            |   |        | LED                                   |
|            |   |        | 15029142 GL-107R5 (red, 7-array LED)  |
|            |   |        | 15029144 SLP-144-40 (red)             |
|            |   |        | 15029143 SLP-139B (red, TUNING GUIDE) |

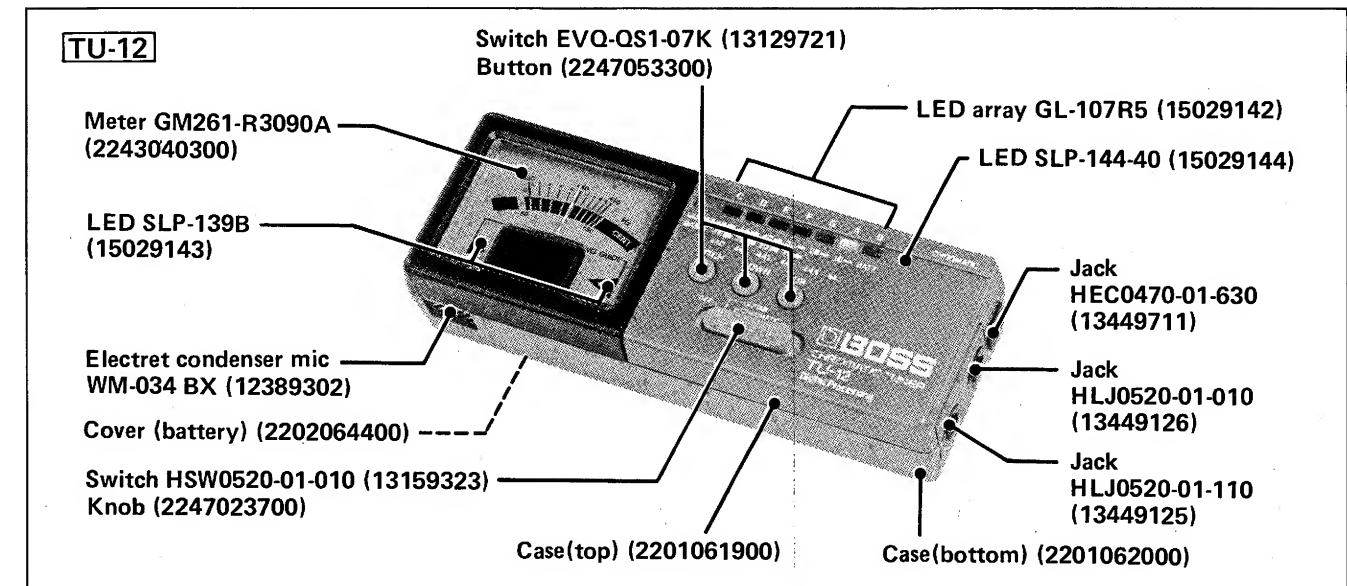
Printed in Japan BE-2

# TU-12

## Second Edition

### SPECIFICATIONS

|                   |   |                |                              |
|-------------------|---|----------------|------------------------------|
| Power Consumption | : 9V DC @ 20mA  | Standard Pitch | : 440 to 445Hz 1Hz steps     |
| Tuning Range      | : C <sub>1</sub> (32.70Hz) to B <sub>5</sub> (987.77Hz) | Dimensions     | : 145(W) x 35(H) x 53(D)mm   |
| Accuracy          | : ±1 cent   |                | : 5-7/16 x 1-3/8 x 2-1/16 in |
| Master Oscillator | : Quartz (3.579545MHz)                                  | Weight         | : 170g 6 oz                  |



### RESISTOR

|            |         |       |      |                  |
|------------|---------|-------|------|------------------|
| 13789114D0 | CRB25DY | 7.68k | 0.5% | (metal film)     |
| 13769262D0 | CRB25FX | 125k  | 1%   | (metal film)     |
| 13729490D0 | ELR-25G | 250k  | 2%   | (vertical mount) |
| 13719491D0 | ELR-25J | 500k  | 5%   | (vertical mount) |

### TRANSISTOR

|          |          |                          |
|----------|----------|--------------------------|
| 15129108 | 2SC945-P | (or 15129114 2SC1815-GR) |
| 15139116 | 2SK118-O | (FET)                    |

### OTHERS

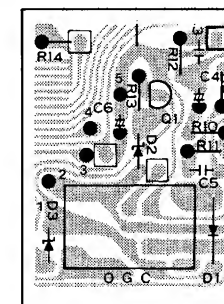
|            |              |
|------------|--------------|
| 2225020200 | Shield Plate |
|------------|--------------|

### CHANGES ON TU-12 MAIN BOARD

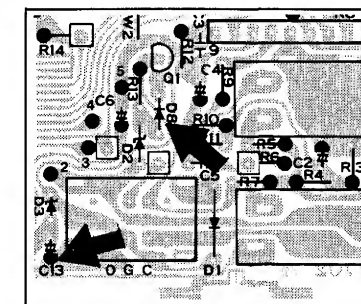
D8, C13 and Q4 are added in later versions for improvement.

Upward compatible change, later versions can be a substitutive for predecessor(s).

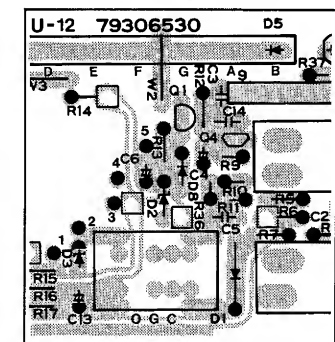
SN up to 294000  
MAIN BOARD 79306510  
(pcb 2291057701)



MAIN BOARD 79306530  
SN 304100—390895  
(pcb 2291057702)



MAIN BOARD 79306530  
SN 390896—up  
(pcb 2291057704)





# TU-12H

## METER CALIBRATION

CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12H ENTERS NORMAL MODE.  
While pushing PITCH, turn power ON (L or H).  
Adjust RT1 for 440Hz.

## SWITCH BOARD

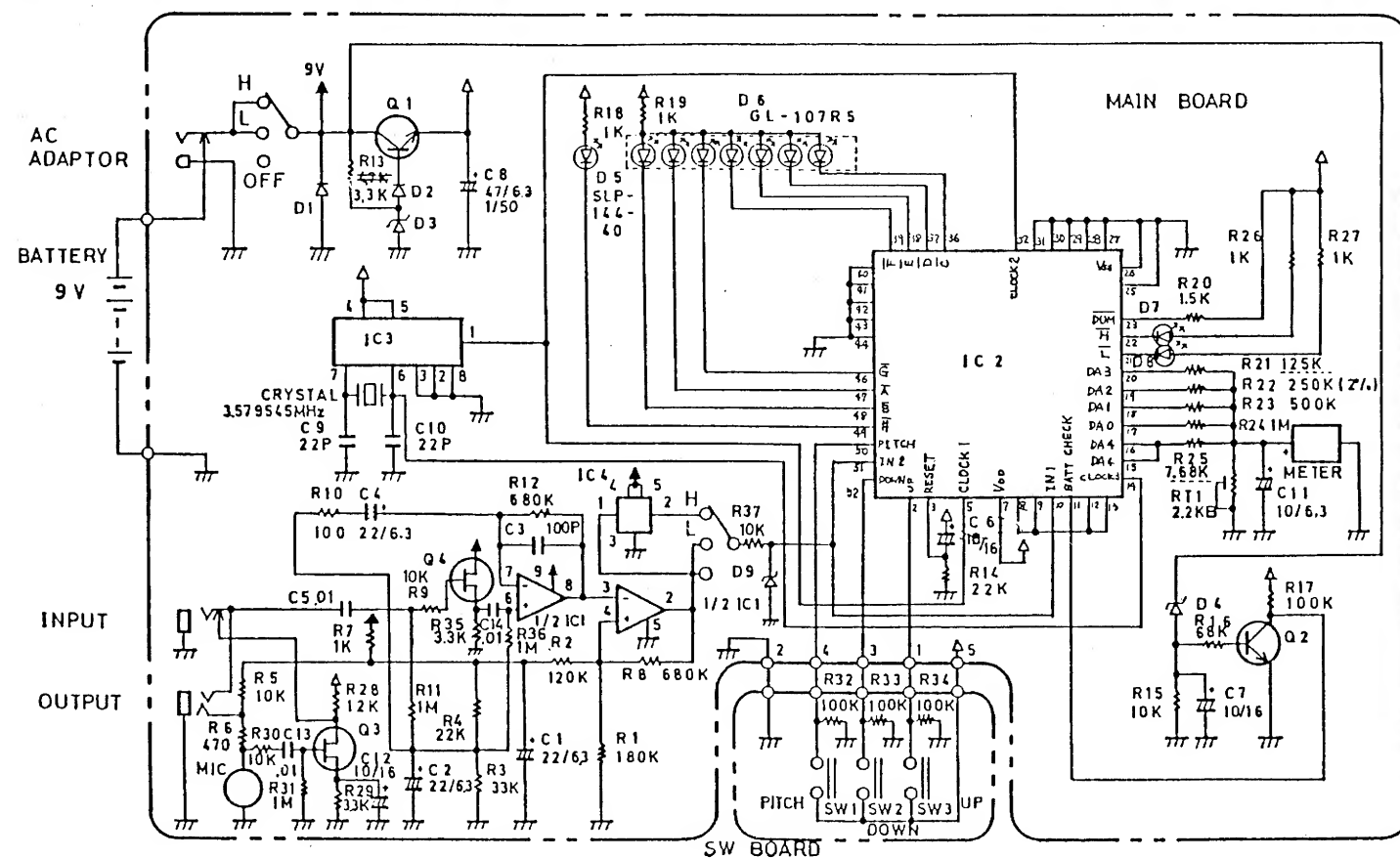
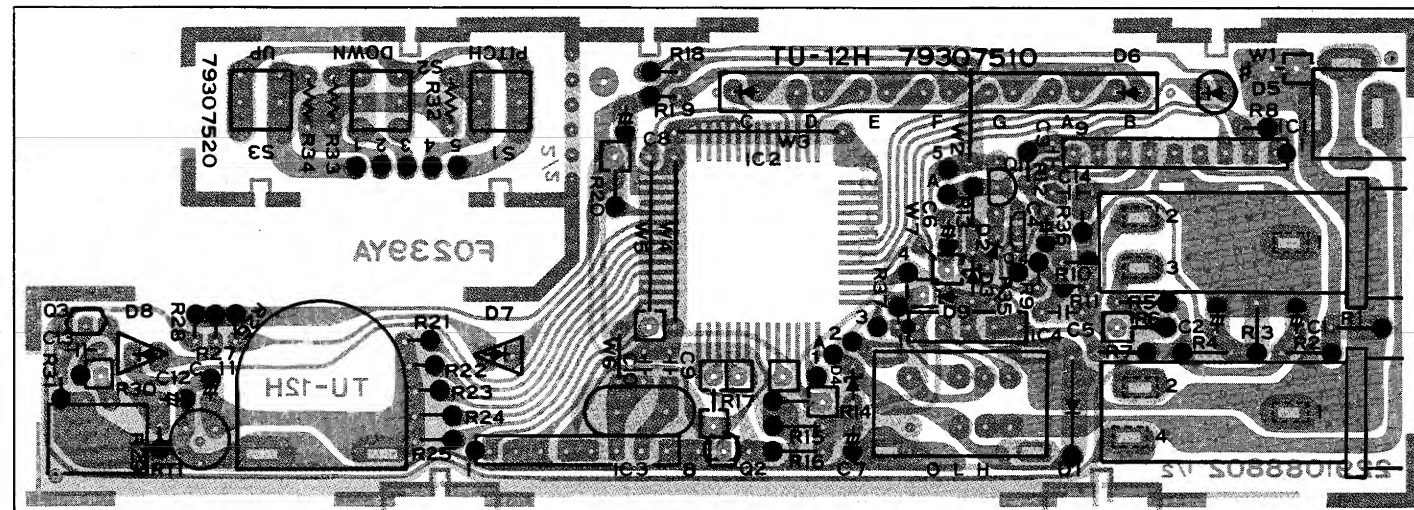
79307520

(pcb 2291088802)

## MAIN BOARD

79307510

(pcb 2291088802)



|               |                 |                 |                   |
|---------------|-----------------|-----------------|-------------------|
| D1 : S5500G   | D7,8 : SLP-139B | Q1,2 : 2SC945-P | IC1 : LA6458S     |
| D2 : MA27WB   | D9 : RD5.1JB2   | Q3,4 : 2SK118-O | IC2 : MBR1012-523 |
| D3 : RD7.5JB2 |                 |                 | IC3 : LC7900      |
| D4 : RD6.8JB2 |                 |                 | IC4 : BA634       |

# TU-12

## METER CALIBRATION

CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12 ENTERS NORMAL MODE.  
While pushing PITCH, turn power ON (GUITAR or CHROMATIC).  
Adjust CR1 for 440Hz.

## SWITCH BOARD

79306540

(pcb 2291057704)

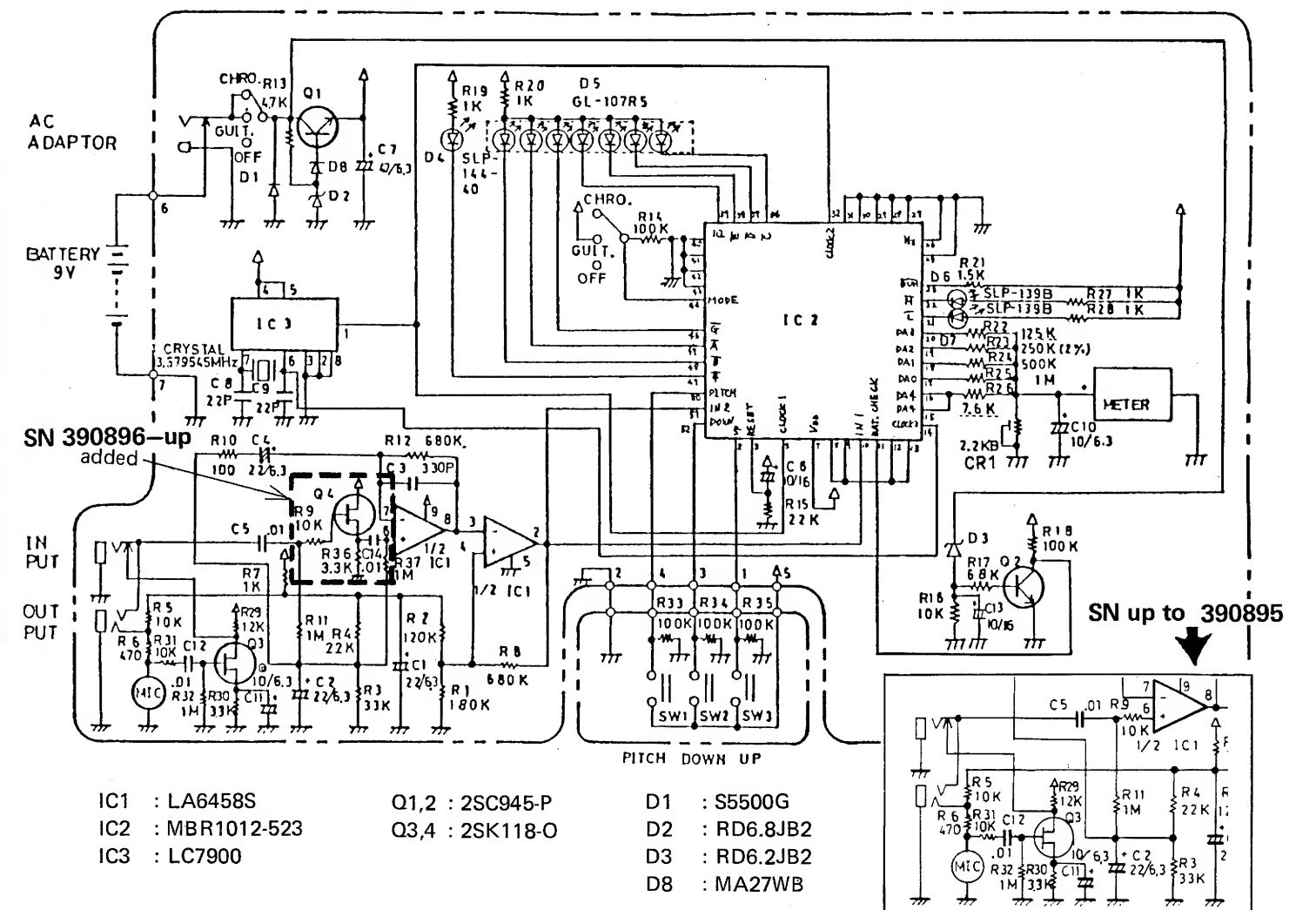
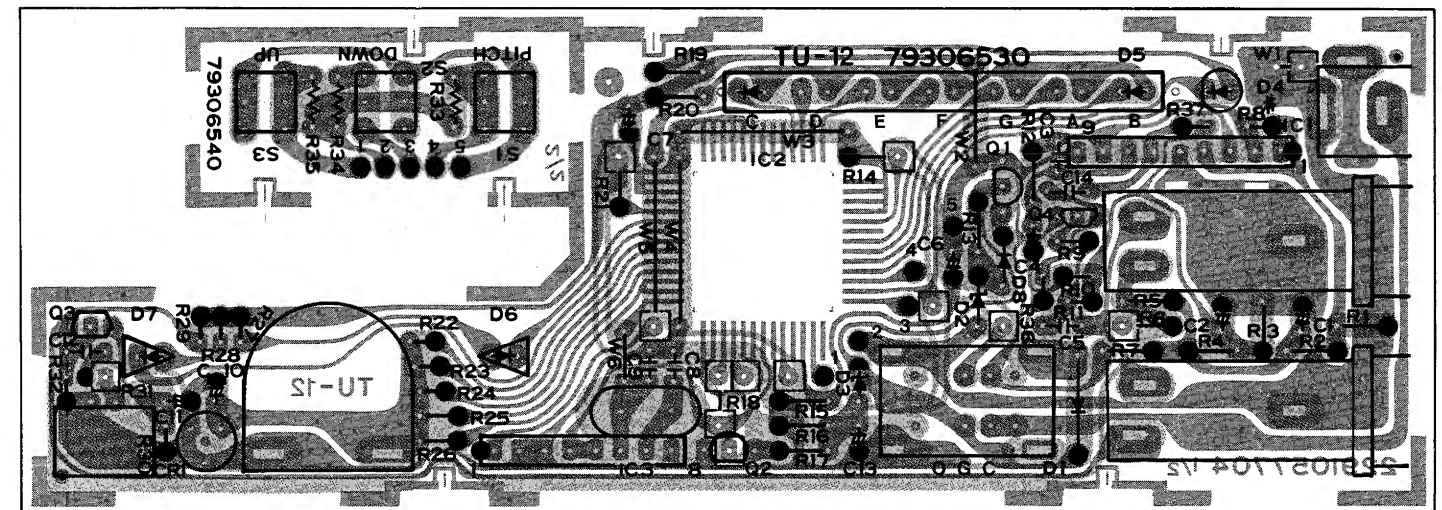
SN 390896-up

compatible with  
predecessors.

## MAIN BOARD

79306530

(pcb 2291057704)



|                   |                 |               |
|-------------------|-----------------|---------------|
| IC1 : LA6458S     | Q1,2 : 2SC945-P | D1 : S5500G   |
| IC2 : MBR1012-523 | Q3,4 : 2SK118-O | D2 : RD6.8JB2 |
| IC3 : LC7900      |                 | D3 : RD6.2JB2 |
|                   |                 | D8 : MA27WB   |